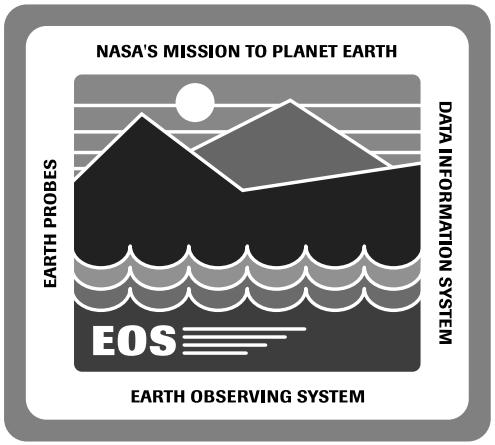
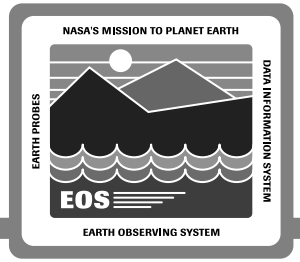


Communications & System Management Segment - Overview

Ed Lerner

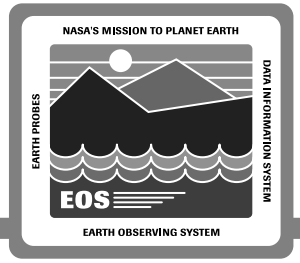
17 January 1995

CSMS PDR Roadmap



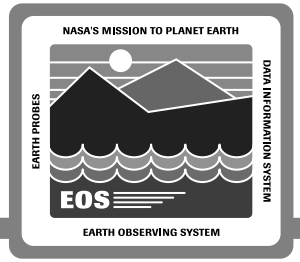
- **Agendas and logistics**
- **PDR Process (ESDIS)**
- **Background**
  - **CSMS Context within EOSDIS**
  - **CSMS Mission and Driving Requirements**
  - **Recap of CSMS's SDR-level design**
  - **ECS Master Schedule**
- **Review objectives and scope**
- **Design process overview**
  - **Design activities**
  - **Documentation**
- **SDPS/FOS-centric perspective of CSMS**
- **CSMS progress since SDR**

CSMS PDR Agenda - Day 1



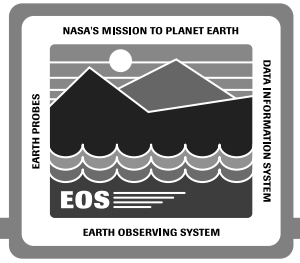
CSMS PDR Introduction / Welcome	**08:00-08:45**
CSMS Overview	**08:45-10:30**
Break	**10:30-10:45**
Internetworking Subsystem (ISS)	**10:45-12:00**
Lunch	**12:00-13:00**
Internetworking Subsystem	**13:00-16:00**
Daily Wrap-Up	**16:00-17:00**

CSMS PDR Agenda - Day 2



Communications Subsystem (CSS)	**08:00-10:15**
Break	**10:15-10:30**
Communications Subsystem	**10:30-12:00**
Lunch	**12:00-13:00**
CSMS Evaluation Package 4	**13:00-15:00**
Daily Wrap-Up	**15:00-16:00**

CSMS PDR Agenda - Day 3



Management Subsystem (MSS)	**08:00-10:00**
Break	**10:00-10:15**
Management Subsystem	**10:15-13:00**
Lunch	**13:00-14:00**
CSS/MSS Sizing Models and Hardware Design	**14:00-15:00**
Security Subarchitecture	**15:00-15:30**
Integration & Test	**15:30-16:45**
CSMS PDR Summary	**16:45-17:00**
Daily Wrap-Up	**17:00-18:00**

Administrative / Facilities

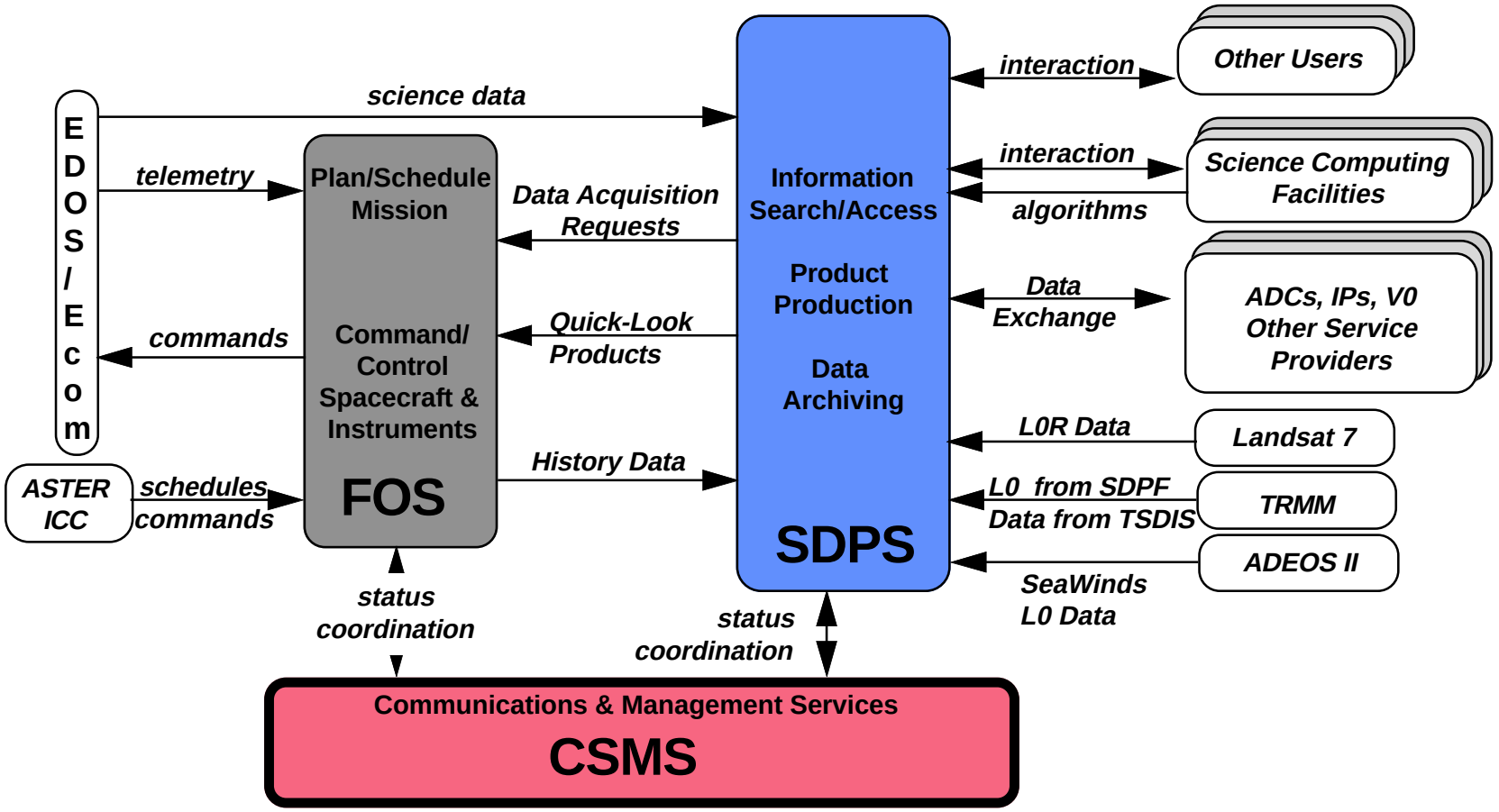
- **Telephones are located in rooms 1131, 1132, and 1133 within the auditorium**

- **Messages and faxes:**
  - **Phone: (301) 925-0300 (main switchboard)**
  - **Fax: (301) 925-0327**
  - **Reference “CSMS PDR, attn: Kim Partida-Runge”**

- **Restrooms are out the auditorium main doors and to your left; follow the signs**

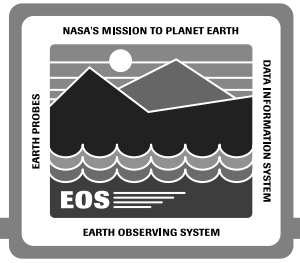
- **Lunch breaks are unstructured**
  - **Cafeteria in the building**
  - **List of nearby restaurants available at registration desk**

CSMS Context Within EOSDIS



All interfaces use communication services provides by CSMS

CSMS Mission & Key Requirements



CSMS is the infrastructure that interconnects and manages ECS. To accomplish its mission, CSMS:

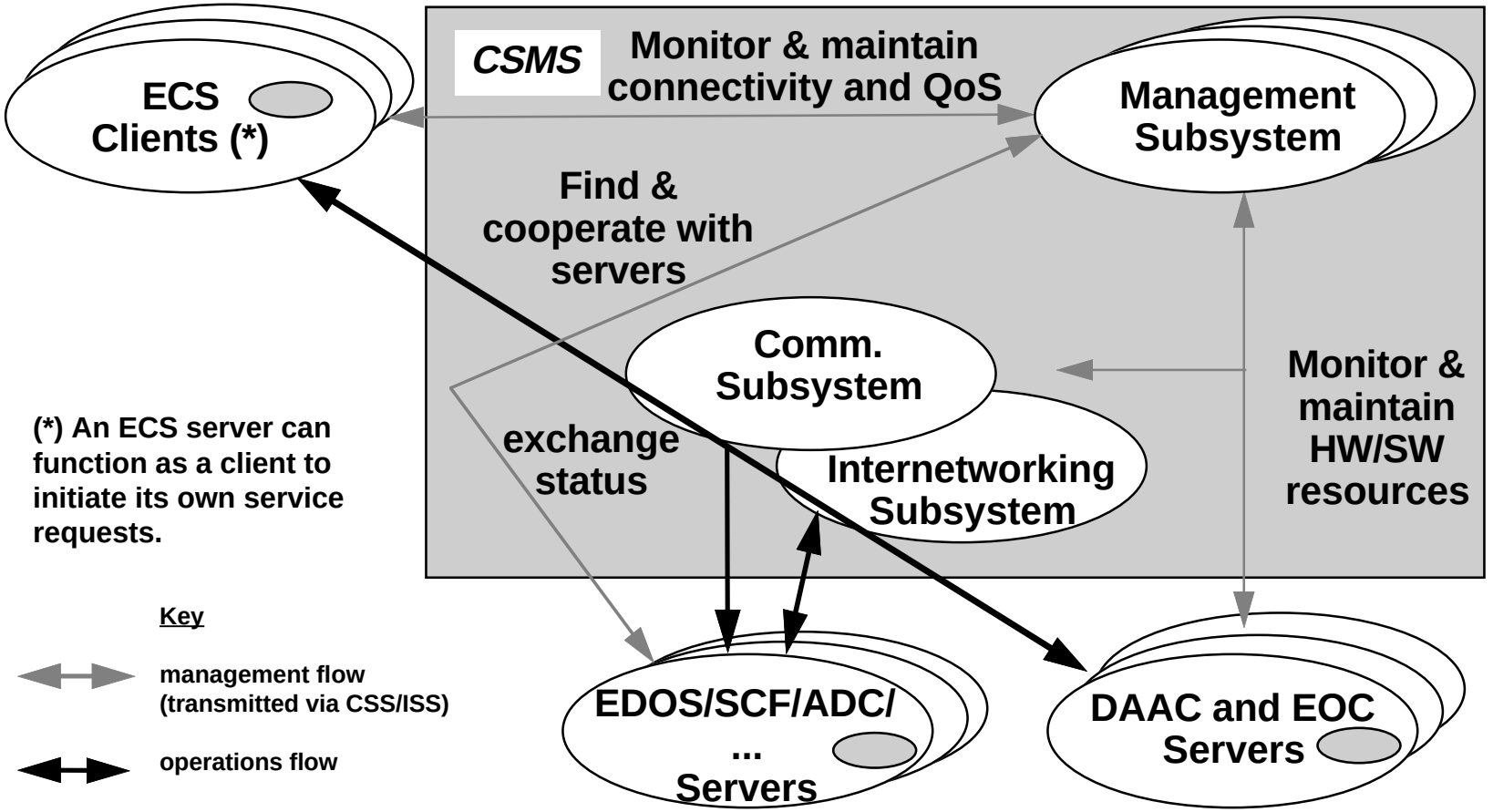
- **Provides network connectivity and/or interfaces**
  - **between users, DAACs, EOC, ISTs, Ecom/EDOS, SCFs, ADCs, EPDSs, IPs**
  - **within DAACs, EOC, and SMC**

- **Provides interoperability between services of FOS, SDPS, and (CSMS's own) management functions in a manner which maximizes flexibility to relocate and evolve those services**

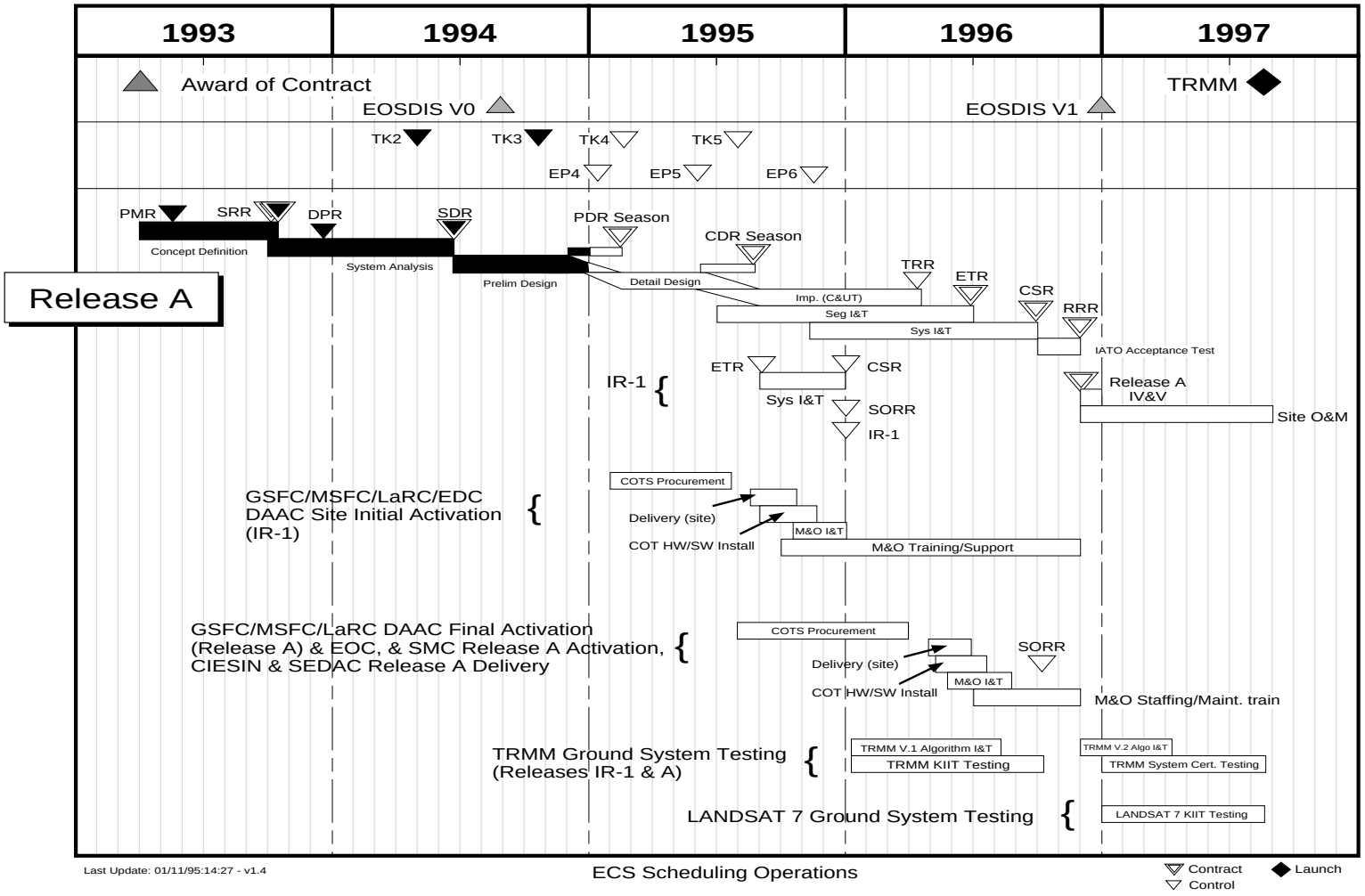
- **Provides management tools for the efficient and effective operation of DAACs, EOC, ESN, and interfaces with other EOSDIS components**

These three core requirements map cleanly into the 3 CSMS subsystems

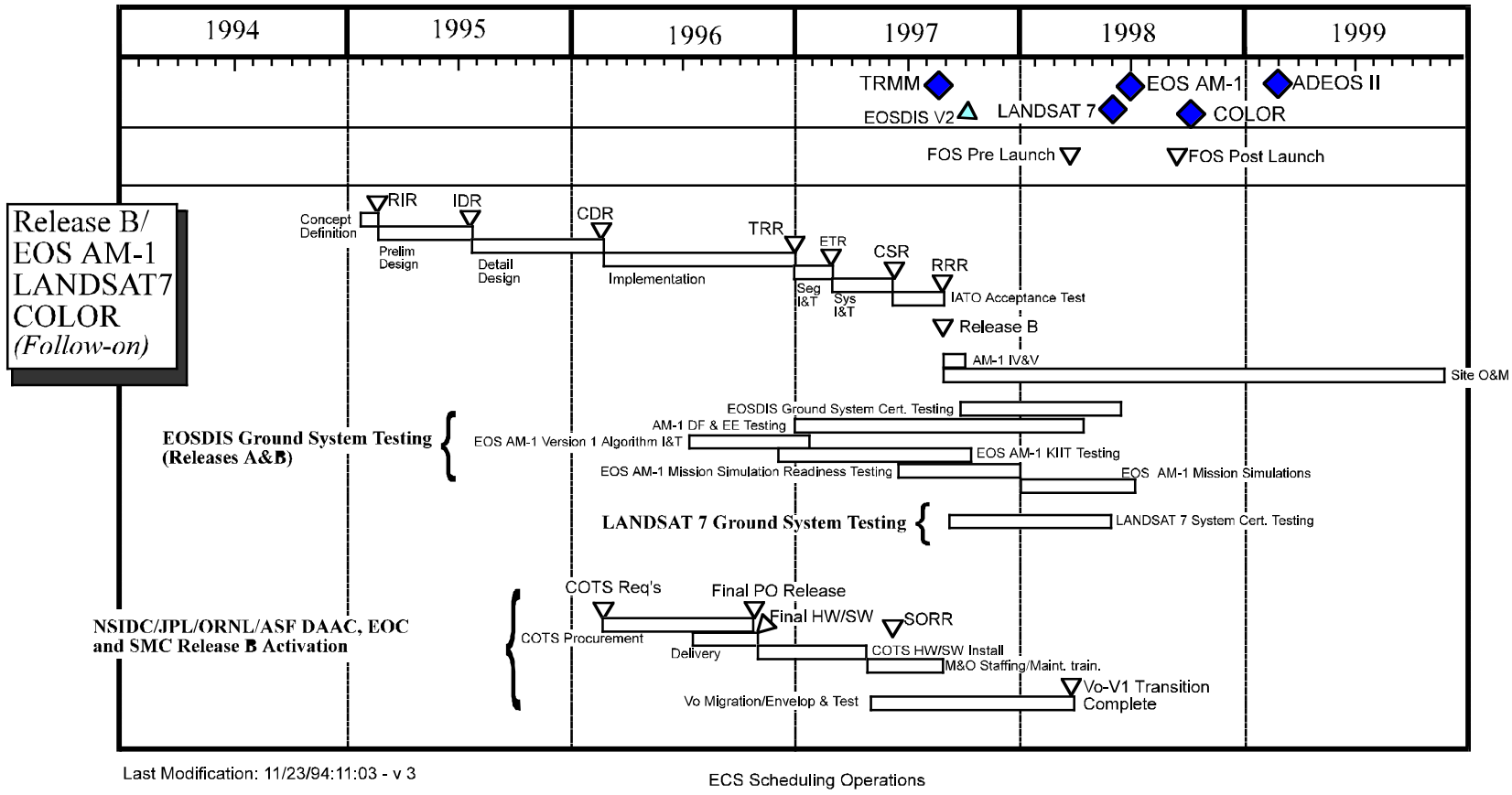
CSMS Design at SDR



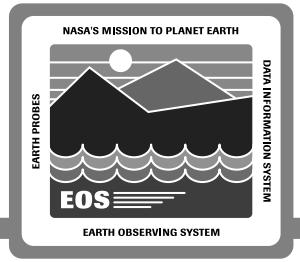
ECS Schedule Overview (Baselined)



ECS Schedule Overview (Not Baselined)

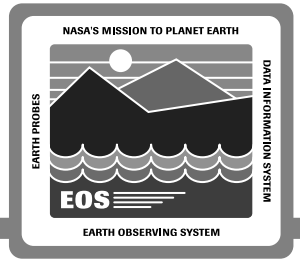


CSMS PDR Objectives



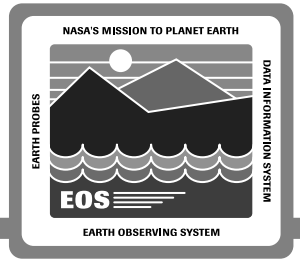
- **Present highlights of the design phase and the supporting prototyping activities just completed**
- **Obtain an independent assessment of the readiness of CSMS design to advance into the detailed design stage**
- **Identify specific areas which would benefit from additional attention before they proceed into detailed design**

CSMS PDR Scope



- **This review summarizes the preliminary design of the 3 CSMS subsystems**
  - **ISS: LANs within ECS locations; ESN WAN between EOSDIS locations**
  - **CSS: distributed-computing middleware base of FOS, SDPS, and MSS**
  - **MSS: DAAC/EOC-based management of computers, LANs, and software; SMC-based WAN management & cross-site monitoring/coordination**
- **We focus on the two initial ECS releases**
  - **TRMM mission preparation ("Interim Release 1", IR-1)**
  - **TRMM operations and AM-1/L-7 mission preparation ("Release A")**
- **Where practical, we have selectively looked ahead to AM-1/L7 operations ("Release B"), and beyond, to facilitate growth and evolution.**

CSMS Services Overview at Releases IR-1 / A



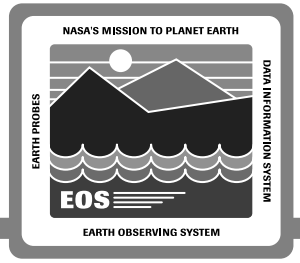
- **Management services**
  - **Fault/configuration/accountability/performance/security management**
  - **Office automation / productivity tools**
  - **Management data collection / display / reports**

- **Communications services**
  - **Client/server application building blocks**
  - **Distributed-computing support services**
  - **Heritage networking applications**

- **Internetworking services**
  - **TCP/IP and UDP/IP over various LANs, MANs, and WANs**

Services shown are subsetted for IR-1

CSMS PDR Scope Details

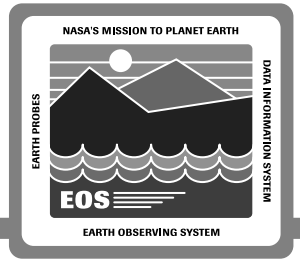


- **ISS**
  - **WANs sized for IR-1 and A; B considered for network costing / evolution**
  - **EOC/SMC LANs sized for B; DAAC LANs presented for IR-1**
  - **DAAC LANs for A/B to be addressed at the SDPS PDR**

- **CSS**
  - **designed for IR-1 and A**
  - **technology selections through B**
  - **migration considerations for C**

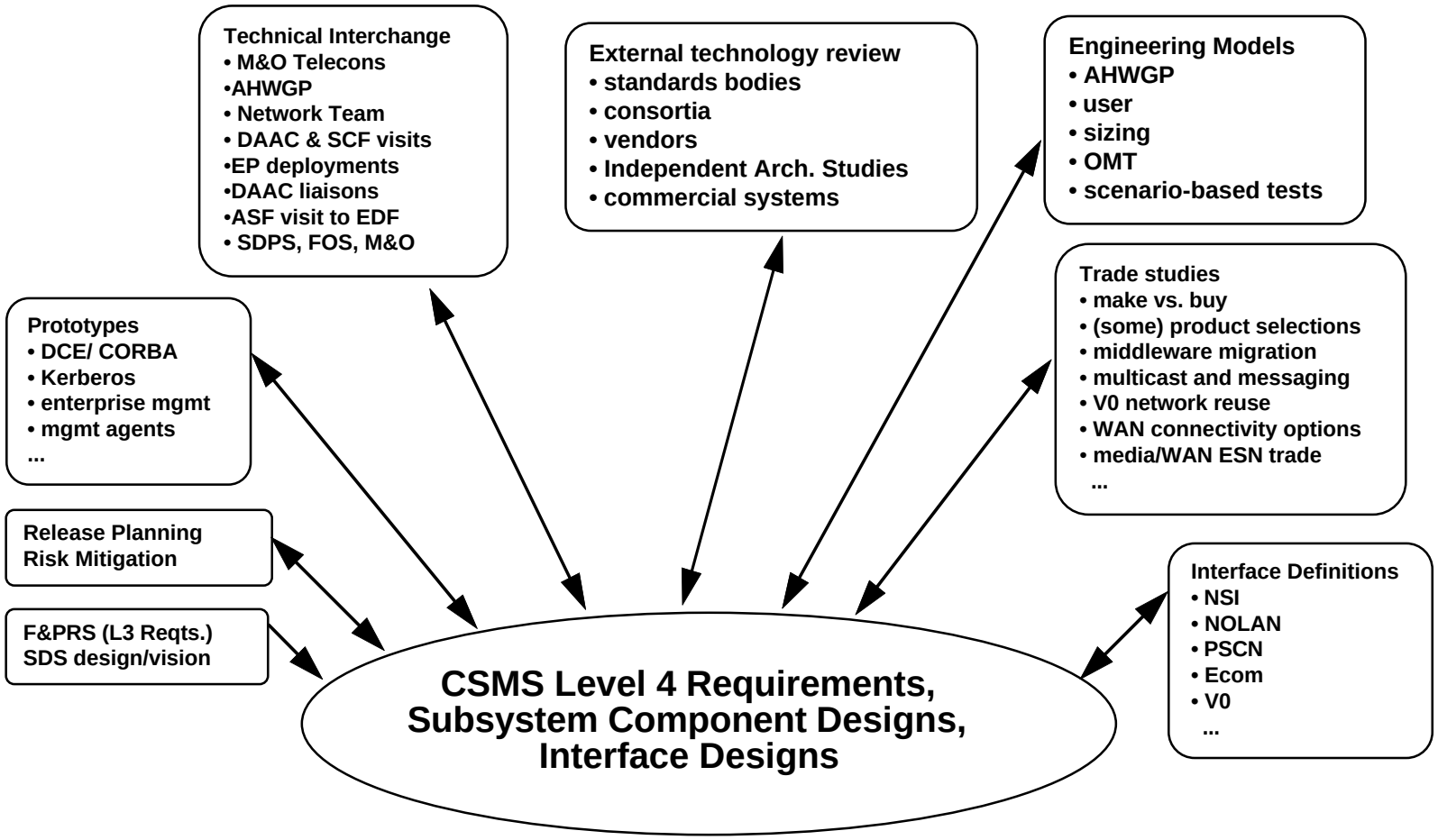
- **MSS**
  - **designed for IR-1 and A**
  - **Release B applications are not covered (e.g., accounting/billing and inter-DAAC schedule coordination/adjudication)**
  - **migration considerations for B**

CSMS PDR Scope Details (cont.)

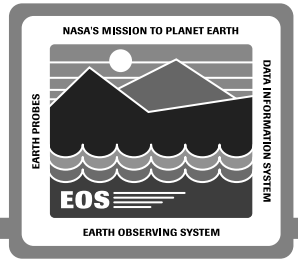


- **Other early looks ahead to Release B:**
  - **IST WAN connectivity study**
  - **multicast study**
  - **design/prototyping of the CSS trader service**
  - **SNMP v2 advanced management protocol**
- **Unless otherwise noted, the current CSMS sizing relies on the November 8th snapshot of the AHWGP data; plus**
  - **ROM of impact of subsetting**
  - **incremental analysis of “tall poles”**

PDR Design Activities



CSMS PDR Documentation Set

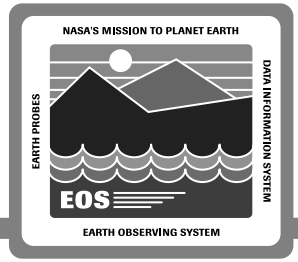


- **Segment PDR deliverables**
  - **Requirements Spec ("Level 4 Requirements")**
  - **Design Specification**
  - **Internal Interface Control Document ("Services Offered ICD")**
  - **Integration & Test Plan (Release IR-1 and A volumes)**

- **Support materials**
  - **Reviewer's guide**
  - **Trades working paper (detail on trades mentioned in SegDS)**
  - **Media vs. ESN WAN technical paper (operations vs. design trade)**

- **Previews of Wrap-up PDR deliverables**
  - **Communications Requirements (WANs) snapshot**
  - **Release Plan / Development Plan snapshot**

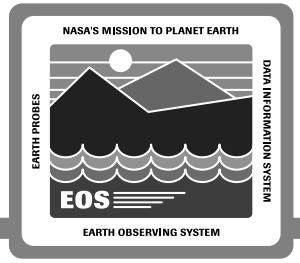
Review Comments as of 1/10/95



- **CSMS-related RIDs from FOS PDR have been referred and are being worked**
- **SDPS use of CSS security services**
- **CSS migration strategy; early vs late move to CORBA**
- **How are backups done?**
- **Scope of application performance measurement, including performance of sets of application**
- **Missing interdependencies in L4s among management services**
- **More detail on use of office automation tools in support of management functions**
- **Detailed observations and suggestions about individual L4s**

We will comment on many (but not all) of these points over the next three days

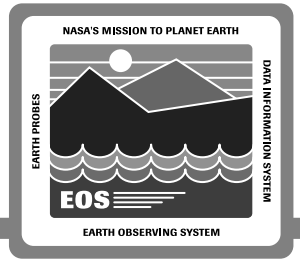
CSMS Design Practice



- **ISS**
  - **100% COTS**
  - **driven by industry and GFE service provider trends**
  - **evolved from the V0 network**
  - **all software comes bundled; software methodologies do not apply**
  - **key methodologies are standards tracking, prototyping/benchmarking, and performance modelling**

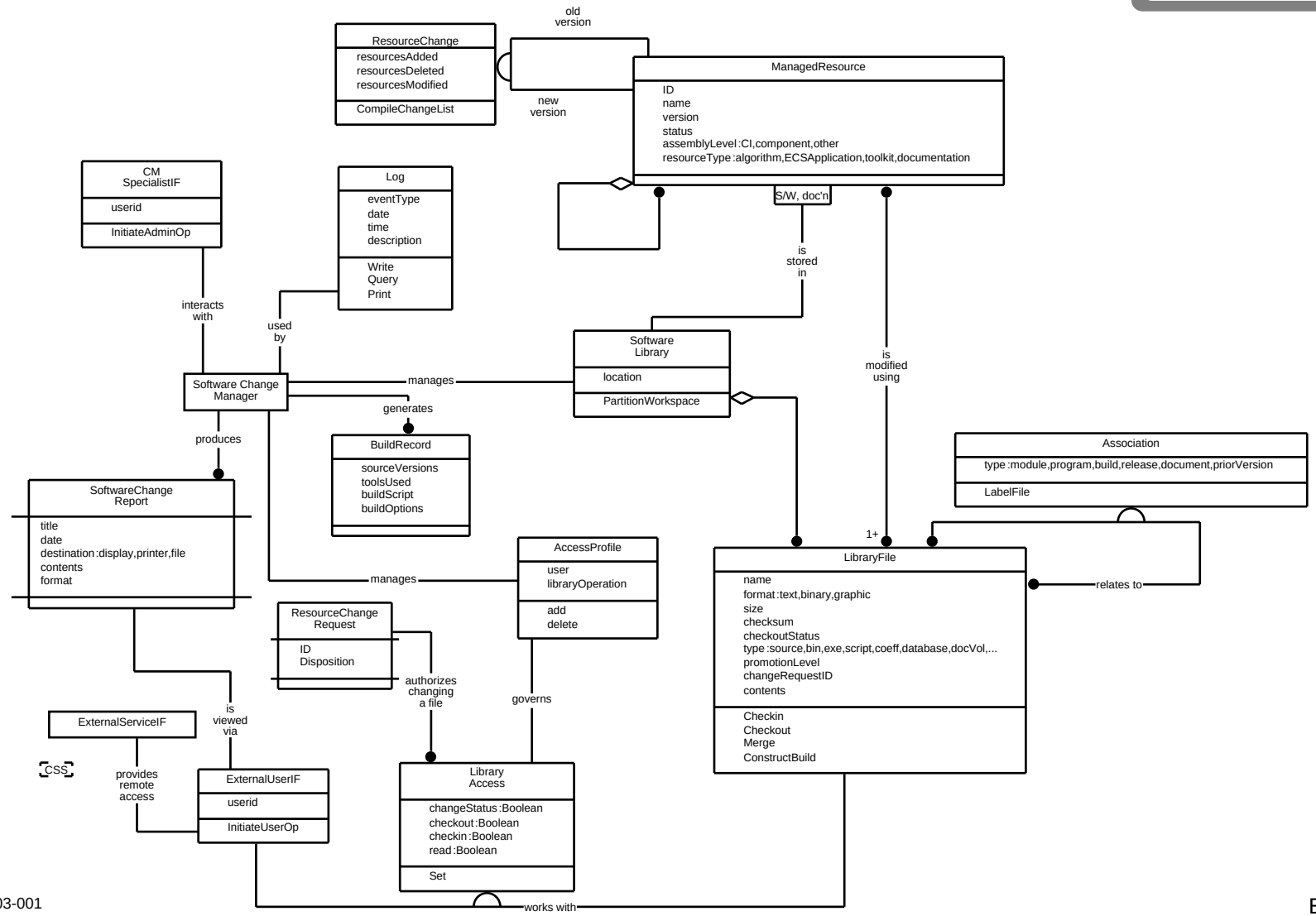
- **CSS**
  - **>90% COTS**
  - **distributed system software (“middleware”)**
  - **driven by industry trends**
  - **custom software is largely glue, encapsulation, and minor enhancements**
  - **software being developed on the incremental track**
  - **key methodologies are standards tracking, prototyping/benchmarking and selective object modeling to enhance understanding/use of COTS**

CSMS Design Practice (cont.)

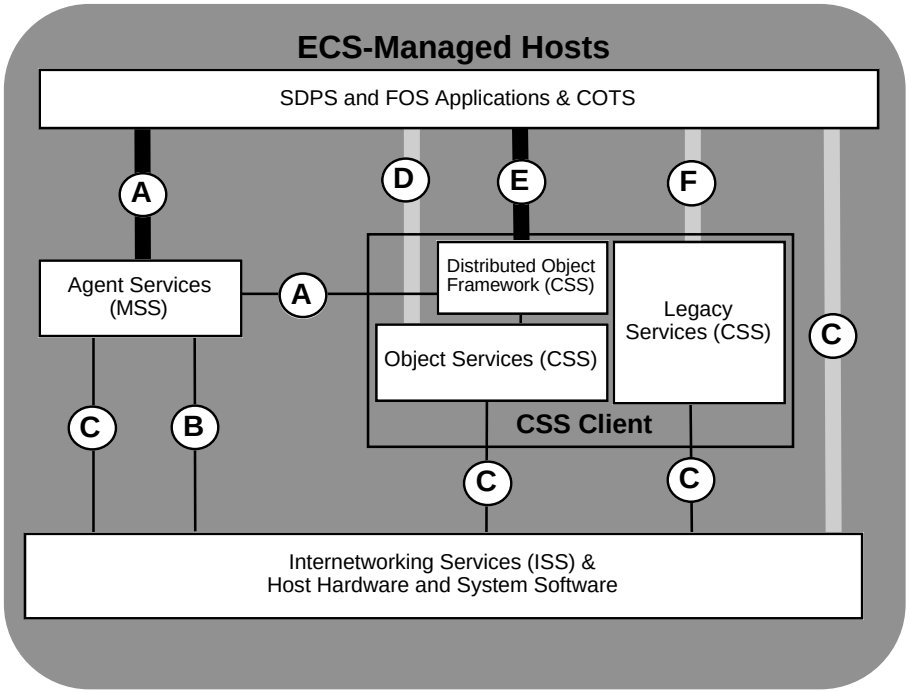


- **MSS**
  - **>90% COTS**
  - **mix of distributed system software and applications software**
  - **driven by industry trends**
  - **custom software is limited to glue, minor enhancements, and selected framework-based applications**
  - **software being developed on the formal track**
  - **key methodologies are standards tracking, object modeling, and prototyping**

Sample Object Model



SDPS/FOS-Centric Perspective

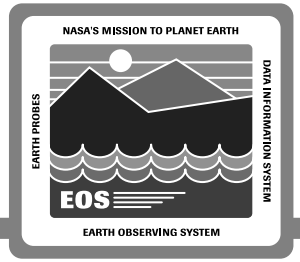


CSMS Interface Class Types Legend:

- Standard client/server application interface
- Optional/special-circumstances/CSMS-internal application interface
- CSMS-internal interface
- (A) Custom management interfaces (e.g., for SDPS Ingest Subsystem applications' reporting of management events and for MSS management of CSS objects)
- (B) COTS management interfaces (e.g., router and host reporting of management events)
- (C) TCP/IP, UDP/IP, and Unix sockets direct interfaces (e.g., interim direct access for heritage planning and scheduling applications and native CSS/ISS interface)
- (D) Custom object service interfaces (e.g., secure session set-up prior to above direct interface activation, FOS subsystems communicating through CSS asynchronous message passing service)
- (E) Custom distributed object framework service interfaces (e.g., SDPS Client Subsytem application binding to a particular Data Server Subsystem server)
- (F) Custom legacy service (CSS) interfaces (e.g., product delivery to scientist from SDPS Data Server application through ftp)

The focusing of SDPS/FOS interfaces to CSMS services minimizes and localizes the impact of future CSMS technology upgrades.

Progress Since SDR



- **Design refinement - service-level decompositions; interface definitions; physical sizing model; physical architecture**
- **On-going prototyping program (demo tomorrow afternoon)**
- **Release IR-1/A-specific instantiations of the SDR architecture**
- **Standards selections; make vs. buy decisions; key product selections for release A (and sometimes beyond)**
- **Risk reduction through movement of CORBA insertion to Release C**
- **Migration strategy refinement**
- **Development scope/effort validation**